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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,722	12/11/2003	Shau-Lin Shue	TS98-615CCC	8563

7590

09/21/2005

George O. Saile  
28 Davis Avenue  
Poughkeepsie, NY 12603

EXAMINER
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GEORGE, PATRICIA ANN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/733,722

Applicant(s)

SHUE ET AL.

Examiner

Patricia A. George

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 9-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/19/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This application repeats a substantial portion of prior Application No. 6,686,280, filed November 20, 2001, and adds and claims additional disclosure not presented in the prior application, such as the claimed ranges for depth of the via hole, as written in claim 9. Since this application names inventors named in the prior application, it may constitute a continuation-in-part of the prior application. Should applicant desire to obtain the benefit of the filing date of the prior application, attention is directed to 35 U.S.C. 120 and 37 CFR 1.78.

### ***Claim Objections***

Claim 13 is objected to because of the following informalities: There appears to be a typo. Does claimed language "between about 1 and 1 KW and 50 KW" intend to say --*between about 1 KW and 50 KW*--? If so, please make the appropriate correction.

### ***Specification***

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

There is no reference in the specification to support either etch step of claim 9: "forming a via hole...to said first wiring layer" and "patterning and etching...to extend a depth below said upper surface".

There is also no reference in the specification to support the "and depth being between about 0.5 and 2 times said dielectric thickness whereby the via hole extends a distance from said trench bottom surface that is between 0.5 and 2 times said dielectric thickness", as written in claim 9.

There is no reference in the in the specification to support an "electrical resistance is less than 0.1 ohms", as written in claim 9.

The specification contains no disclosure arising from the "aspect ratio less than about 6:1", as written in claim 9.

There is no reference in the specification to support "gold, and silver", as written in claim 10.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The phrases "the second wiring layer" and "metal via" in the last step of claim 9 render the claim indefinite because it is unclear if the phrases both refer to the same metal structure. It is suggested that applicants amend the claim by using the same phrase each time they identify the metal portion of the structure formed in the last step of claim 9. For instance, are applicants intending the second wiring layer to be the same as the metal via? Claim 9, and all claims dependent or indirectly dependent are rejected.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 9-11 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,686,280. Although the conflicting claims are not identical, they are not patentably distinct from each other because they have the following limitations in common: forming an opening (written on via hole) having a bottom surface, a mouth, and side walls; depositing a first seed layer of metal to a first thickness to coat the integrated circuit upper surface (written on coating the dielectric layer), the bottom surface, and the side walls; sputter etching said seed layer, to reduce its thickness by a first amount, thereby preferentially removing some overhanging material present at the mouth of the opening; preferentially removing any remaining overhanging material present at the mouth of the opening; depositing additional metal whereby said opening becomes completely filled with void free metal (written on depositing metal to form a filler layer that overfills the trench with metal).

A differences is noted between the present claims and claim 1 of 6,686,280. Claim 1 of 6,686,280 does not contain the dimensions of film thickness as defined in the present claims.

It would have been obvious to one of ordinary skill in the art at the time of invention was made, to modify claim 1 of U.S. Patent No. 6,686,280 to include desirable dimensions such as those defined in the present claims because where patentability is said to be based upon particular chosen dimensions or upon another variable recited in the claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 f.2d 1578, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). Applicants have not shown that the claimed dimension ranges are critical.

### ***Double Patenting***

Claims 11 and 12 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 9 of U.S. Patent No. 6,686,280. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 11 they are both drawn to a similar method of forming a metal via. A difference is noted between the present claims 11 & 12 and claim 9 of USPN 6,688,280. Claims 11-2 are broader than claim 9 and are obvious because they fully encompass claim 9.

**Conclusion**

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: USPN 5,296,407.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia A. George whose telephone number is (571)272-5955. The examiner can normally be reached on weekdays between 7:00am and 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571)272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patricia A George  
Examiner  
Art Unit 1765

PAG  
08/05



NADINE G. NORTON  
SUPERVISORY PATENT EXAMINER

